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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,188	03/02/2004	Katsunori Suzuki	118655	2943

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EXAMINER	
MACARTHUR, SYLVIA	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
11/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,188	SUZUKI ET AL.	
	Examiner	Art Unit	
	Sylvia R. MacArthur	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection. The amendment of claims 1 and 6 the quartz ring surrounds a wafer holder, that the quartz ring is constructed of a first portion and a second portion, such that the height of the first region (nearest the workpiece and/or the showerhead electrode) is greater than that of the second region (extending outward from the first region) as illustrated in Fig.1 specifically elements 18 and/or 20. Claims 1 and 6 also positively recite that the first and second portions are made of a monolithic piece of quartz ring. The prior art of Erskine et al (US 5,262,029) illustrates in Fig. 3 and 3A monolithic piece of ring having first and second portions constructed as recited in the present invention. For the purposes of examination, the examiner interprets the term monolithic as an integrated, unitary, singular piece of material. Erskine et al in col. 5 lines 20-39 teaches that the clamp ring 80 is constructed of a conductive or nonconductive rigid material, but fails to specifically teach quartz. Likewise, Inoue et al (US 2002/0185658) see Figs. 2 and 3 illustrates a monolithic ring (dam member 31) having first and second portions as claimed in the present invention. Inoue et al, like Erskine et al fails to teach the ring is made of quartz. The prior art of Ishii US 5,529,657 teaches a focus ring 6 made of an insulator (type of non-conductive material) and recites quartz as a preferred material of construction, see col. 4 lines 49- col. 5 line 21. Ishii further recites in col. 5 lines 1-12 that the insulating material serves to (or its use is motivated by) causing the lines of electric force in the chamber to be attracted by the central portion of the chamber 2 to be substantially parallel to the wafer W. Thus, the examiner rejects claims 1-9 with Erskine et al or Inoue et al (both teach the

first and second portions with the claimed height difference and integrated to form a single ring) in view of Ishii (which teaches the use of quartz as the material of construction of ring and the motivation thereof).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erskine et al or Inoue et al in view of Ishii.
Re claims 1 and 6: Erskine et al teaches a ring for use in a plasma processing apparatus see abstract, comprising: an inner perimeter, a main surface extending outwardly from the inner perimeter; a first portion around the inner perimeter, the first portion having a flat first region on the main surface; and a second portion adjacent to an outer perimeter of the first portion having a smaller thickness than the first portion, the second portion having a second region adjacent to the first region on the main surface, the second region having a height lower than that of the first region; wherein the first region and the second region are regions of the ring and are parallel to each other, see Figs. 3 and 3A. Erskine et al in col. 5 lines 20-39 teaches that the clamp ring 80 is constructed of a conductive or nonconductive rigid material, but fails to specifically teach quartz. Likewise, Inoue et al (US 2002/0185658) see Figs. 2 and 3 illustrates a monolithic ring (dam member 31) having first and second portions as claimed in the present invention. The prior art of Ishii US 5,529,657 teaches a focus ring 6 made of an insulator (type of non-conductive material) and recites quartz as a preferred material of construction, see col. 4 lines 49- col. 5 line 21. Ishii further recites in col. 5 lines 1-12 that the insulating material serves to (or its use is

motivated by) causing the lines of electric force in the chamber to be attracted by the central portion of the chamber 2 to be substantially parallel to the wafer W.

The motivation to construct the ring of Erskine et al or Inoue et al of quartz is that that this dielectric material has such properties as it is a known insulator. Thus, it would have been obvious to construct the ring of Erskine et al or Inoue et al of quartz as it is a known dielectric and insulator material. Additionally, the courts have held that the selection of a material based upon its suitability for its intended use is prima facie obviousness, Sinclair & Carroll Co. v. Interchemical Corp., 325 US 327, 65 USPQ 297 (1945).

Re claims 2, 3, and 7: See Figs of Erskine et al and Inoue et al.

Regarding claims 4 and 8: The teachings of Erskine et al or Inoue et al were discussed above.

Both fail to teach the specific dimensions for the heights of the first and second regions.

Ishii teaches in col. 5 lines 1-12 that the dimensions of the focus ring 6 must be such that that the lines of electric force in the chamber are attracted by the central portion of the chamber so as to be parallel with the workpiece, W.

The specific height of the stepped regions is a matter of optimization, the courts have held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. It would have been obvious to one have ordinary skill in the art to have determined the optimum values of the relevant process parameters (such as the heights of the portions of the focus ring) through routine experimentation in the absence of a showing of criticality, In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA 1955).The motivation for provide a difference in height between the first and second regions with the first region being higher than the second is to protect the chamber

and electrodes from damage from the plasma process or that the height of the first portion is the same as the wafer to protect the wafer from over processing.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to optimize the heights of the first and second regions and their subsequent difference in height to ensure optimal protection of the chamber and electrode.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Erskine et al or Inoue et al in view of Ishii et al as applied in claims 1-4 and 6-8 above in further view of Ma et al (US 2002/0139478).

The teachings of the prior art of Erskine et al or Inoue et al in view of Ishii et al as applied in claims 1-4 and 6-8 above.

Both Erskine et al as modified by Ishii or Inoue et al as modified by Ishii fail to teach the quartz ring comprises a beveled surface.

The prior art by Ma et al teaches a ring surrounding a workpiece in a plasma chamber. Ma et al further teaches in col. 8 lines 10-19 and col.9 lines 5-23, beveling the inner edge of edge ring 24. Therein, Ma et al teaches beveling to form and angel with a plane perpendicular to the wafer surface. According to the col. 9 lines 5-23, the beveling affects the processing rate. The motivation to bevel the quartz rings of Erskine et al or Inoue et al in view of Ishii et al are taught in col. 9 lines 19-23 by Ma et al is that beveling causes the perturbation of the plasma sheath, which increase the edge processing rate.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to bevel the contour along the inner perimeter of the quartz ring of Erskine et al or Inoue et al in view of Ishii et al to provide an increased processing rate.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Erskine et al or Inoue et al in view of Ishii et al as applied in claims 1-4 and 6-8 above in further view of Dhindsa et al (US 6,391,787).

The teachings of the prior art of Erskine et al or Inoue et al in view of Ishii et al as applied in claims 1-4 and 6-8 above.

Both Erskine et al as modified by Ishii or Inoue et al as modified by Ishii fail to teach the second quartz ring.

Dhindsa et al teaches a quartz ring (see col. 6 line 10 and Figs. 1A-C), teaches a quartz ring 11 integral with showerhead electrode 10 for use in a plasma processing apparatus, and a second quartz ring 17.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Namely, the amendment of claims 1 and 6 that the first portion and second portion are of a monolithic piece of quartz and wherein the quartz ring surrounds a wafer holder... Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

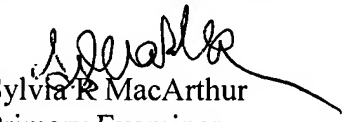
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sylvia R MacArthur
Primary Examiner
Art Unit 1792

November 11, 2007